

## CLAIMS

What is claimed is:

1. A method for routing data packets in a wireless network at a node  $i$ ,

5 comprising:

selecting a neighbor  $p$  as the next hop in a route from node  $i$  to destination  $j$  if

(i) the path from neighbor  $p$  to destination  $j$  does not include node  $i$  and does not repeat any node, and

(ii)  $D_{yp}^i < D_{yx}^i$  for any other neighbor  $x$  and for all nodes  $y$  that are in the path from destination  $j$  to neighbor  $p$ ,

where  $D_{yp}^i$  is the distance value of the route from node  $i$  to node  $y$  through

neighbor  $p$  and  $D_{yx}^i$  is the distance value of the route from node  $i$  to node  $y$  through neighbor  $x$ .

2. A method as recited in claim 1,

wherein a first node considers a second as its neighbor if it hears update messages from said second node; and

wherein said first node no longer considers said second node as its neighbor if said first node cannot send data packets to said second node.

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3. A method as recited in claim 1, further comprising:

sending updates to a routing table if

a node discovers a new destination with a finite and valid path to the destination, or

a node loses the last path to a destination, or

a node suffers a distance increase to a destination.

4. A method as recited in claim 1, further comprising:

sending a unicast routing table update from a node to a neighbor that sends it a data packet, if the neighbor is upstream from it towards the destination; and

sending a unicast routing table update from a node to a neighbor that sends it a data packet when the path implied by the neighbor's distance table entry is different from the path implied by the node's routing table.

5. A method for routing data packets in a wireless network at a node  $i$ , comprising:

(a) selecting a neighbor  $p$  as the next hop in a route from node  $i$  to destination

$j$  if

(i) the path from neighbor  $p$  to destination  $j$  does not include node  $i$  and does not repeat any node, and

(ii)  $D_{yp}^i < D_{yx}^i$  for any other neighbor  $x$  and for all nodes  $y$  that are in the path from destination  $j$  to neighbor  $p$ ,

where  $D_{yp}^i$  is the distance value of the route from node  $i$  to node  $y$  through neighbor  $p$  and  $D_{yx}^i$  is the distance value of the route from node  $i$  to node  $y$  through neighbor  $x$ ;

(b) wherein a first node considers a second as its neighbor if it hears update messages from said second node; and

(c) wherein said first node no longer considers said second node as its neighbor if said first node cannot send data packets to said second node.

6. A method as recited in claim 5, further comprising sending updates to a routing table if

a node discovers a new destination with a finite and valid path to the destination, or

a node loses the last path to a destination, or

a node suffers a distance increase to a destination.

7. A method as recited in claim 5, further comprising:

sending a unicast routing table update from a node to a neighbor that sends it a data packet, if the neighbor is upstream from it towards the destination; and

sending a unicast routing table update from a node to a neighbor that sends it a data packet when the path implied by the neighbor's distance table entry is different from the path implied by the node's routing table.

5           8.     A method for routing data packets in a wireless network at a node  $i$ ,  
comprising:

(a)     selecting a neighbor  $p$  as the next hop in a route from node  $i$  to destination  
 $j$  if

- (i)     the path from neighbor  $p$  to destination  $j$  does not include node  $i$   
and does not repeat any node, and
- (ii)     $D_{yp}^i < D_{yx}^i$  for any other neighbor  $x$  and for all nodes  $y$  that are in the  
path from destination  $j$  to neighbor  $p$ ,

where  $D_{yp}^i$  is the distance value of the route from node  $i$  to node  $y$  through  
neighbor  $p$  and  $D_{yx}^i$  is the distance value of the route from node  $i$  to node  $y$   
through neighbor  $x$ ; and

(b)     sending updates to a routing table if

- (i)     a node discovers a new destination with a finite and valid path to  
the destination, or
- (ii)    a node loses the last path to a destination, or
- (iii)   a node suffers a distance increase to a destination.

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9. A method as recited in claim 8,  
wherein a first node considers a second as its neighbor if it hears update  
messages from said second node; and  
wherein said first node no longer considers said second node as its neighbor if  
5 said first node cannot send data packets to said second node.

10. A method as recited in claim 8, further comprising:  
sending a unicast routing table update from a node to a neighbor that  
sends it a data packet, if the neighbor is upstream from it towards the destination;  
and  
40 sending a unicast routing table update from a node to a neighbor that  
sends it a data packet when the path implied by the neighbor's distance table  
entry is different from the path implied by the node's routing table.

11. A method for routing data packets in a wireless network at a node  $i$ ,  
comprising:  
15 (a) selecting a neighbor  $p$  as the next hop in a route from node  $i$  to destination  
 $j$  if  
(i) the path from neighbor  $p$  to destination  $j$  does not include node  $i$   
20 and does not repeat any node, and  
(ii)  $D_{yp}^i < D_{yx}^i$  for any other neighbor  $x$  and for all nodes  $y$  that are in the  
path from destination  $j$  to neighbor  $p$ ,

where  $D_{yp}^i$  is the distance value of the route from node  $i$  to node  $y$  through neighbor  $p$  and  $D_{yx}^i$  is the distance value of the route from node  $i$  to node  $y$  through neighbor  $x$ ;

(b) sending a unicast routing table update from a node to a neighbor that  
5 sends it a data packet, if the neighbor is upstream from it towards the destination; and

(c) sending a unicast routing table update from a node to a neighbor that  
sends it a data packet when the path implied by the neighbor's distance table entry is  
different from the path implied by the node's routing table.

12. A method as recited in claim 11,

wherein a first node considers a second as its neighbor if it hears update  
messages from said second node; and

wherein said first node no longer considers said second node as its neighbor if  
said first node cannot send data packets to said second node.

13. A method as recited in claim 11, further comprising  
sending updates to a routing table if

a node discovers a new destination with a finite and valid path to the  
destination, or

a node loses the last path to a destination, or

a node suffers a distance increase to a destination.

14. A method for routing data packets in a wireless network at a node  $i$ , comprising:

(a) selecting a neighbor  $p$  as the next hop in a route from node  $i$  to destination

5  $j$  if

(i) the path from neighbor  $p$  to destination  $j$  does not include node  $i$  and does not repeat any node, and

(ii)  $D_{yp}^i < D_{yx}^i$  for any other neighbor  $x$  and for all nodes  $y$  that are in the path from destination  $j$  to neighbor  $p$ ,

10 where  $D_{yp}^i$  is the distance value of the route from node  $i$  to node  $y$  through neighbor  $p$  and  $D_{yx}^i$  is the distance value of the route from node  $i$  to node  $y$  through neighbor  $x$ ; and

(b) sending updates to a routing table if

(i) a node discovers a new destination with a finite and valid path to the destination, or

(ii) a node loses the last path to a destination, or

(iii) a node suffers a distance increase to a destination;

(c) wherein a first node considers a second as its neighbor if it hears update messages from said second node; and

20 (d) wherein said first node no longer considers said second node as its neighbor if said first node cannot send data packets to said second node.

15. A method as recited in claim 14, further comprising:

5 sending a unicast routing table update from a node to a neighbor that sends it a data packet, if the neighbor is upstream from it towards the destination; and

sending a unicast routing table update from a node to a neighbor that sends it a data packet when the path implied by the neighbor's distance table entry is different from the path implied by the node's routing table.

10 16. A method for routing data packets in a wireless network at a node  $i$ , comprising:

(a) selecting a neighbor  $p$  as the next hop in a route from node  $i$  to destination  $j$  if

(i) the path from neighbor  $p$  to destination  $j$  does not include node  $i$  and does not repeat any node, and

(ii)  $D_{yp}^i < D_{yx}^i$  for any other neighbor  $x$  and for all nodes  $y$  that are in the path from destination  $j$  to neighbor  $p$ ,

where  $D_{yp}^i$  is the distance value of the route from node  $i$  to node  $y$  through

neighbor  $p$  and  $D_{yx}^i$  is the distance value of the route from node  $i$  to node  $y$

20 through neighbor  $x$ ;

(b) sending a unicast routing table update from a node to a neighbor that



sends it a data packet, if the neighbor is upstream from it towards the destination; and

(c) sending a unicast routing table update from a node to a neighbor that sends it a data packet when the path implied by the neighbor's distance table entry is different from the path implied by the node's routing table;

5 (d) wherein a first node considers a second as its neighbor if it hears update messages from said second node; and

(e) wherein said first node no longer considers said second node as its neighbor if said first node cannot send data packets to said second node.

10 17. A method as recited in claim 16, further comprising

sending updates to a routing table if

a node discovers a new destination with a finite and valid path to the destination, or

a node loses the last path to a destination, or

a node suffers a distance increase to a destination.

15 18. A method for routing data packets in a wireless network at a node  $i$ , comprising:

(a) selecting a neighbor  $p$  as the next hop in a route from node  $i$  to destination

20  $j$  if

(i) the path from neighbor  $p$  to destination  $j$  does not include node  $i$  and does not repeat any node, and

- (ii)  $D_{yp}^i < D_{yx}^i$  for any other neighbor  $x$  and for all nodes  $y$  that are in the path from destination  $j$  to neighbor  $p$ ,

where  $D_{yp}^i$  is the distance value of the route from node  $i$  to node  $y$  through neighbor  $p$  and  $D_{yx}^i$  is the distance value of the route from node  $i$  to node  $y$  through neighbor  $x$ ;

- (b) sending updates to a routing table if

- (i) a node discovers a new destination with a finite and valid path to the destination, or
- (ii) a node loses the last path to a destination, or
- (iii) a node suffers a distance increase to a destination;

(c) sending a unicast routing table update from a node to a neighbor that sends it a data packet, if the neighbor is upstream from it towards the destination; and

(d) sending a unicast routing table update from a node to a neighbor that sends it a data packet when the path implied by the neighbor's distance table entry is different from the path implied by the node's routing table.

19. A method as recited in claim 18,

wherein a first node considers a second as its neighbor if it hears update messages from said second node; and

wherein said first node no longer considers said second node as its neighbor if said first node cannot send data packets to said second node.

20. A method for routing data packets in a wireless network at a node  $i$ , comprising:

(a) selecting a neighbor  $p$  as the next hop in a route from node  $i$  to destination

5  $j$  if

(i) the path from neighbor  $p$  to destination  $j$  does not include node  $i$  and does not repeat any node, and

(ii)  $D_{yp}^i < D_{yx}^i$  for any other neighbor  $x$  and for all nodes  $y$  that are in the path from destination  $j$  to neighbor  $p$ ,

10 where  $D_{yp}^i$  is the distance value of the route from node  $i$  to node  $y$  through neighbor  $p$  and  $D_{yx}^i$  is the distance value of the route from node  $i$  to node  $y$  through neighbor  $x$ ;

(b) sending updates to a routing table if

(i) a node discovers a new destination with a finite and valid path to the destination, or

(ii) a node loses the last path to a destination, or

(iii) a node suffers a distance increase to a destination.

(c) sending a unicast routing table update from a node to a neighbor that sends it a data packet, if the neighbor is upstream from it towards the destination; and

20 (d) sending a unicast routing table update from a node to a neighbor that sends it a data packet when the path implied by the neighbor's distance table entry is

different from the path implied by the node's routing table;

(e) wherein a first node considers a second as its neighbor if it hears update messages from said second node; and

(f) wherein said first node no longer considers said second node as its  
5 neighbor if said first node cannot send data packets to said second node.

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